Listing of Claims:

Claims 1-20 (cancelled).

Claim 21 (new): A terminal device, comprising:

a key generation unit comprising a semiconductor element and a coding circuit configured to convert an electric property of said semiconductor element into a digital signal so that a value of said digital signal varies with variation in said electric property of said semiconductor element to generate a key for encryption and outputting said key;

an encryption circuit configured to encrypt transmitting data on the basis of said key; and

a decoder circuit configured to decode receiving data on the basis of said key.

Claim 22 (new): The terminal device according to claim 21, wherein

said encryption circuit and said decoder circuit are incorporated in a main body portion, and

said key generation unit is incorporated in an auxiliary portion detachable from said main body portion.

Claim 23 (new): The terminal device according to claim 22, wherein

said auxiliary portion is an IC card.

Claim 24 (new): The terminal device according to claim 21, wherein

said semiconductor element has a polycrystalline substance, and

said variation in said electric property of said semiconductor element is caused by a variation in crystal structure of said polycrystalline substance.

Claim 25 (new): A terminal device, comprising:

a communication circuit configured to perform radio communication through a communication common carrier equipment; and

a radio communication network circuit configured to perform radio communication by forming a radio communication network not through said communication common carrier equipment.

Claim 26 (new): The terminal device according to claim 25, further comprising:

a selector circuit configured to selectively perform connection and disconnection of a path through which communication signals are transmitted and received between said communication circuit and said radio communication network circuit, to selectively establish communication between a user of said terminal device and one other person through said radio communication network and a relay of communication between a plurality of persons other than said user of said terminal device through said radio communication network.

Claim 27 (new): A communication method, using:

a semiconductor device, comprising:

N ($1 \leq$ N) code generation unit formed in N semiconductor substrate in one-to-one correspondence, each of said N code generation unit being configured to generate an identification code inherent in a corresponding semiconductor substrate;

N memory formed in one-to-one correspondence to said N identification code, each of said N memory storing a code which coincides with a corresponding identification code as a memory code, and each of said N memory being formed in another semiconductor substrate than a corresponding semiconductor substrate; and

N comparator circuit formed in one-to-one correspondence to said N identification code, each of said N comparator circuit being configured to compare a corresponding identification code and a corresponding memory code to thereby judge whether or not these codes coincide with each other and to output an enable signal representing the judgment result, and

a terminal device, comprising:

a communication circuit configured to transmit and receive a signal between said semiconductor device and the outside,

wherein said communication circuit transmits said N enable signal as part of said signal to said outside,

wherein said communication method enables a communication common carrier equipment and said terminal device to perform mutual communication, and comprises the steps of:

(a) transmitting said N enable signal from said terminal device to said communication common carrier equipment; and

(b) as an authentication step, performing an authentication that a user of said terminal device is an authorized user by said communication common carrier equipment when a condition that each of said N enable signal received by said communication common carrier equipment indicates coincidence between a corresponding identification code and a corresponding memory code is satisfied and not performing said authentication by said communication common carrier equipment when said condition is not satisfied.

Claim 28 (new): A communication method, using:

a semiconductor device, comprising:

N ($1 \leq N$) code generation unit formed in N semiconductor substrate in one-to-one correspondence, each of said N code generation unit being configured to generate an identification code inherent in a corresponding semiconductor substrate; and

N memory formed in one-to-one correspondence to said N identification code, each of said N memory storing a code which coincides with a corresponding identification code as a memory code, and each of said N memory being formed in another semiconductor substrate than a corresponding semiconductor substrate, and

a terminal device, comprising:

a communication circuit configured to transmit and receive a signal between said semiconductor device and the outside,

wherein said communication circuit transmits said N identification code and said N memory code as part of said signal to said outside,

wherein said communication method enables a communication common carrier equipment and said terminal device to perform mutual communication, and comprises the steps of:

(a) transmitting said N identification code and said N memory code from said terminal device to said communication common carrier equipment;

(b) comparing each of said N identification code and a corresponding memory code which are received to judge whether or not each of said N identification code and a corresponding memory code coincides with each other by said communication common carrier equipment; and

(c) as an authentication step, performing an authentication that a user of said terminal device is an authorized user by said communication common carrier equipment when a condition that a judgment result indicates coincidence between each of said N identification

code and a corresponding memory code in said step (b) is satisfied and not performing said authentication by said communication common carrier equipment when said condition is not satisfied.

Claim 29 (new): A communication method, using:

a semiconductor device, comprising:

N ($1 \leq N$) code generation unit formed in N semiconductor substrate in one-to-one correspondence, each of said N code generation unit being configured to generate an identification code inherent in a corresponding semiconductor substrate; and

N memory formed in one-to-one correspondence to said N identification code, each of said N memory storing a code which coincides with a corresponding identification code as a memory code, and each of said N memory being formed in another semiconductor substrate than a corresponding semiconductor substrate, and

a terminal device, comprising:

a communication circuit configured to transmit and receive a signal between said semiconductor device and the outside,

wherein said communication circuit transmits said N identification code and said N memory code as part of said signal to said outside,

said number N is one,

said N code generation unit and said communication circuit are incorporated in a main body portion, and

said N memory is incorporated in an auxiliary portion detachable from said main body portion,

wherein said communication method comprises the steps of:

(a) obtaining said N identification code of said terminal device to store said N identification code as a first registered code by said communication common carrier equipment;

(b) obtaining said N memory code of said terminal device to store said N memory code as a second registered code by said communication common carrier equipment; and

(c) as a communication step, performing mutual communication between said communication common carrier equipment and said terminal device after said steps (a) and (b),

wherein said step (c) comprises

(c-1) a first communication step which is performed when said auxiliary portion is not attached to said main body portion, and

(c-2) a second communication step which is performed when said auxiliary portion is attached to said main body portion,

said first communication step (c-1) comprises the steps of:

(c-1-1) transmitting said N identification code from said terminal device to said communication common carrier equipment;

(c-1-2) comparing said N identification code which is received with said first registered code to judge whether or not said N identification code and said first registered code coincide with each other by said communication common carrier equipment; and

(c-1-3) as an authentication step, performing an authentication that a user of said terminal device is an authorized user by said communication common carrier equipment when a condition that the judgment result indicates coincidence between said N identification code and said first registered code in said step (c-1-2) is satisfied

and not performing said authentication by said communication common carrier equipment when said condition is not satisfied, and

said second communication step (c-2) comprises the steps of:

(c-2-1) transmitting said N identification code and said N memory code from said terminal device to said communication common carrier equipment;

(c-2-2) comparing said N identification code which is received with said first registered code to judge whether or not said N identification code and said first registered code coincide with each other and comparing said N memory code which is received with said second registered code to judge whether or not said N memory code and said second registered code coincide with each other by said communication common carrier equipment; and

(c-2-3) as a high-level authentication step, performing a high-level authentication that a user of said terminal device is an authorized user by said communication common carrier equipment when a condition that both two judgment results indicate coincidences in said step (c-2-2) is satisfied and not performing said high-level authentication by said communication common carrier equipment when said condition is not satisfied.

Claim 30 (new): A communication method, using:

a semiconductor device, comprising:

N ($1 \leq$ N) code generation unit formed in N semiconductor substrate in one-to-one correspondence, each of said N code generation unit being configured to generate an identification code inherent in a corresponding semiconductor substrate; and

N memory formed in one-to-one correspondence to said N identification code, each of said N memory storing a code which coincides with a corresponding identification code as a memory code, and each of said N memory being formed in another semiconductor substrate than a corresponding semiconductor substrate, and

a terminal device, comprising:

a communication circuit configured to transmit and receive a signal between said semiconductor device and the outside,

wherein said communication circuit transmits said N identification code and said N memory code as part of said signal to said outside,

said number N is one,

said N code generation unit and said communication circuit are incorporated in a main body portion,

wherein said main body portion further incorporates:

a first key generation unit configured to generate a first key for encryption; and

a first encryption circuit configured to encrypt said identification code generated by said N code generation unit on the basis of said first key,

said N memory is incorporated in an auxiliary portion detachable from said main body portion,

wherein said auxiliary portion further incorporates:

a second key generation unit configured to generate a second key for encryption; and

a second encryption circuit configured to encrypt said memory code stored in said N memory on the basis of said second key,

said first encryption circuit also encrypts said memory code encrypted by said second encryption circuit on the basis of said first key,

said communication circuit transmits said identification code and said memory code both in a form encrypted by said first encryption circuit to said outside,

wherein said communication method comprises the steps of:

(a) obtaining said N identification code and said first key from said terminal device to store said N identification code and said first key as a first registered code and a registered key, respectively, by said communication common carrier equipment;

(b) obtaining said N memory code which is encrypted with said second key of said terminal device to store said N memory code as a second registered code by said communication common carrier equipment; and

(c) as a communication step, performing mutual communication between said communication common carrier equipment and said terminal device after said steps (a) and (b),

wherein said communication step (c) comprises

(c-1) a first communication step which is performed when said auxiliary portion is not attached to said main body portion, and

(c-2) a second communication step which is performed when said auxiliary portion is attached to said main body portion,

said first communication step (c-1) comprises the steps of:

(c-1-1) transmitting said N identification code in a form encrypted by said first encryption circuit from said terminal device to said communication common carrier equipment;

(c-1-2) decoding said N identification code which is received on the basis of said registered key and comparing said N identification code with said first registered

code to judge whether or not said N identification code and said first registered code coincide with each other by said communication common carrier equipment; and

(c-1-3) as an authentication step, performing an authentication that a user of said terminal device is an authorized user by said communication common carrier equipment when a condition that the judgment result indicates coincidence between said N identification code and said first registered code in said step (c-1-2) is satisfied and not performing said authentication by said communication common carrier equipment when said condition is not satisfied, and

said second communication step (c-2) comprises the steps of

(c-2-1) transmitting said N identification code and said N memory code both in a form encrypted by said first encryption circuit from said terminal device to said communication common carrier equipment;

(c-2-2) decoding said N identification code and said N memory code which are received on the basis of said registered key and comparing said N identification code with said first registered code to judge whether or not said N identification code and said first registered code coincide with each other and comparing said N memory code with said second registered code to judge whether or not said N memory code and said second registered code coincide with each other by said communication common carrier equipment; and

(c-2-3) as a high-level authentication step, performing a high-level authentication that a user of said terminal device is an authorized user by said communication common carrier equipment when a condition that both two judgment results indicate coincidences in said step (c-2-2) is satisfied and not performing said high-level authentication by said communication common carrier equipment when said condition is not satisfied.

Claim 31 (new): A communication method enabling communication between terminal devices each of which is capable of performing radio communication through a communication common carrier equipment and forming a radio communication network not through said communication common carrier equipment in a space where people in crowds carrying said terminal devices assemble or pass by, by forming said radio communication network among said terminal devices carried by at least some of said people, even when a region where said radio communication can not be performed through said communication common carrier equipment exists in said space.

What is claimed is:

1. A semiconductor device, comprising:

N ($1 \leqq N$) code generation unit formed in N semiconductor substrate in one to one correspondence, each of said N code generation unit being configured to generate an identification code inherent in a corresponding semiconductor substrate; and

N memory formed in one-to-one correspondence to said N identification code, each of said N memory storing a code which coincides with a corresponding identification code as a memory code, and each of said N memory being formed in other semiconductor substrate than a corresponding semiconductor substrate.

2. The semiconductor device according to claim 1, wherein

each of said N memory comprises an OTPROM storing said memory code.

3. The semiconductor device according to claim 1, wherein

each of said N code generation unit comprises

a semiconductor element; and

a coding circuit configured to convert an electric property of said semiconductor element into a digital signal so that a value of said digital signal varies with variation in said electric property of said semiconductor element to generate said identification code and outputting said identification code.

4. The semiconductor device according to claim 3, wherein

said semiconductor element has a polycrystalline substance, and

said variation in said electric property of said semiconductor element is caused

by variation in crystal structure of said polycrystalline substance.

5. The semiconductor device according to claim 1, wherein

each of said N code generation unit comprises an OTPROM storing said identification code.

6. The semiconductor device according to claim 1, further comprising:

N comparator circuit formed in one-to-one correspondence to said N identification code, each of said N comparator circuit being configured to compare a corresponding identification code and a corresponding memory code to thereby judge whether these codes coincide with each other or not and outputting an enable signal representing the judgment result.

7. The semiconductor device according to claim 6, wherein

each of said N comparator circuit is formed in said semiconductor substrate corresponding to a corresponding identification code to be compared.

8. The semiconductor device according to claim 7, further comprising:

N key generation unit, N encryption circuit and N decoder circuit formed in one-to-one correspondence to said N identification code, each of said N key generation unit, each of said N encryption circuit and each of said N decoder circuit being formed in said semiconductor substrate corresponding to a corresponding identification code,

wherein each of said N key generation unit generates a key for encryption inherent in a corresponding semiconductor substrate,

each of said N encryption circuit encrypts said identification code generated by

said code generation unit formed in a corresponding semiconductor substrate on the basis of a corresponding key and transmits said identification code of encrypted form to said corresponding memory,

each of said N memory stores said identification code of encrypted form outputted from a corresponding encryption circuit as said memory code of encrypted form,

each of said N decoder circuit decodes said memory code of encrypted form stored in a corresponding memory on the basis of a corresponding key, and

each of said N comparator circuit compares said identification code generated by a corresponding code generation unit with said memory code decoded by a corresponding decoder circuit.

9. The semiconductor device according to claim 8, wherein

each of said N key generation unit comprises

another semiconductor element;

another coding circuit for converting an electric property of said another semiconductor element into another digital signal so that a value of said another digital signal varies with variation in said electric property of said another semiconductor element to generate said key and outputting said key.

10. The semiconductor device according to claim 9, wherein

said another semiconductor element has another polycrystalline substance, and

said variation in said electric property of said another semiconductor element is caused by variation in crystal structure of said another polycrystalline substance.

11. The semiconductor device according to claim 8, wherein

each of said N key generation unit comprises an OTPROM storing said key.

12. The semiconductor device according to claim 7, further comprising

N switching circuit formed in one-to-one correspondence to said N identification code, each of said N switching circuit being formed in said semiconductor substrate corresponding to a corresponding identification code, each of said N switching circuit being configured to exclusively perform a transmission of a corresponding identification code generated by a corresponding code generation unit to a corresponding memory and an input of said memory code stored in said corresponding memory to a corresponding comparator circuit.

13. The semiconductor device according to claim 6, further comprising

a predetermined circuit including a circuit portion which selectively comes into an active state or an inactive state, depending on said N enable signal respectively corresponding to said N identification code.

14. The semiconductor device according to claim 13, wherein

said predetermined circuit is formed in one of said N semiconductor substrate together with a corresponding comparator circuit.

15. The semiconductor device according to claim 1, wherein

said number N is one.

16. The semiconductor device according to claim 1, wherein

said number N is two, and

each of said N code generation unit and a corresponding memory are formed respectively in one and the other of said N semiconductor substrates.

17. A terminal device, comprising:

said semiconductor device as defined in claim 13,

wherein said predetermined circuit is a communication circuit for transmitting and receiving a signal to and from the outside, and

at least one of transmission and reception is stopped when said N enable signal indicates noncoincidence between at least one of said N identification code and a corresponding memory code.

18. A terminal device, comprising:

said semiconductor device as defined in claim 6; and

a communication circuit configured to transmit and receive a signal to and from the outside,

wherein said communication circuit transmits said N enable signal as part of said signal to said outside.

19. A terminal device, comprising:

said semiconductor device as defined in claim 1; and

a communication circuit configured to transmit and receive a signal to and from the outside,

wherein said communication circuit transmits said N identification code and said N memory code as part of said signal to said outside.

20. The terminal device according to claim 19, wherein

said number N is one,

said N code generation unit and said communication circuit are incorporated in a main body portion, and

said N memory is incorporated in an auxiliary portion detachable from said main body portion.